

A TAXONOMIC REVISION OF *CERBERA* L. (APOCYNACEAE) IN AUSTRALIA AND PAPUASIA

Paul I. Forster

Queensland Herbarium, Meiers Road, Indooroopilly, Qld 4068, Australia

Summary

The genus *Cerbera* L. (Apocynaceae) is revised for Australia and Papuaia (Irian Jaya, Papua New Guinea and Solomon Islands). Four species are recognised and described with a key for their identification given. *C. manghas* L. and *C. floribunda* Schumann are widespread in the region whereas *C. inflata* S.T. Blake and *C. dunicola* sp. nov. are endemic to Australia. Ethnobotanical use of *C. floribunda* and *C. manghas* in the region is reviewed.

Introduction

The genus *Cerbera* was described by Linnaeus (1753) who recognised three species, namely *C. manghas* L. *C. thevetia* L. and *C. ahouai* L. *C. thevetia* and *C. ahouai* are now considered to be *Cascabela thevetia* (L.) Lippold (syn. *Thevetia peruviana* (Pers.) Schumann) and *Thevetia ahouai* (L.) DC. respectively. *Cerbera manghas* is now widely considered the lectotype of *Cerbera* (Lippold 1980; Boiteau 1981; Smith 1988). Subsequent to Linnaeus, additional species have been added to *Cerbera*, and until recently eight or nine species were considered to belong in the genus (Lippold 1980, Smith 1988). However, Lippold (1980) in her review did not refer to Markgraf (1972) or Fosberg *et al.* (1977) wherein several of these species were referred to *Kopsia* Blume or *Neisosperma* Raf. The genus *Cerbera* up to now therefore comprises *C. manghas*, *C. floribunda* Schumann, *C. odollam* Gaertner, *C. dilatata* Markgraf, *C. inflata* S.T. Blake, and *C. micrantha* (Kanchiru) Pichon.

As defined by Lippold (1980), Boiteau (1981) and Smith (1988), *Cerbera* is most closely allied to genera such as *Cerberiopsis* Vieillard ex Pancher & Sebert from New Caledonia and *Thevetia* L. and *Cascabela* Rafinesque from South America. It differs from *Cerberiopsis* in the indehiscent, fleshy polycarpous fruit lacking albumen (Boiteau 1981), from *Thevetia* most noticeably in the lack of a floral disk, the indehiscent, fleshy polycarpous fruit with a fleshy exocarp, reticulate spongy mesocarp and woody endocarp, and from *Cascabela* in the hypocrateriform corolla, lack of scales in the corolla throat, lack of a floral disk and the woody endocarp (Lippold 1980).

The only previous taxonomic accounts of *Cerbera* in Australia have been by Bentham (1869) and Bailey (1900) who both recognised only a single species from the area, *C. manghas* (incorrectly as *C. odollam* Gaertner). *C. floribunda* Schumann and *C. manghas* L. were both recognised for New Guinea by Markgraf (1926, 1927), and the former for Australia by White (1933). Blake (1948) subsequently described a new species from north-east Queensland, firstly under the illegitimate *C. dilatata* S.T. Blake but later renaming it as *C. inflata* (Blake 1959). Up to the present there has been three described species recognised for the region although in many Australian herbaria there existed considerable undetermined material which has proved to contain collections of an undescribed species from Queensland.

As a precursor to my treatment of the genus in Volume 28 of 'Flora of Australia', the present revision is presented to enable description of the unnamed species from Australia, describe and provide a key for identification of all recognised species, and to typify the names of taxa where required. In addition, I have appended notes on local common names and ethnobotanical use, primarily of *C. floribunda* and *C. manghas* in Papuaia.

Materials and Methods

This revision is based on herbarium specimens in AD, BO, BRI, BSIP, CANB, CBG, DNA, MEL and QRS (herbarium acronyms as in Holmgren *et al.* 1990), and on plants observed in the field in north Queensland and Solomon Islands. The generic description is largely adapted from Smith (1988) who gave a good overview of the

important features. Species descriptions have been drawn up from dried material or material reconstituted by boiling in detergent and water; however, the descriptions of *C. manghas* and *C. floribunda* are supplemented by observations of fresh and spirit preserved material. With the distribution maps, those for *C. manghas* and *C. floribunda* include supplementary specimen data presented by Markgraf (1927).

Taxonomic Treatment

Cerbera L., Sp. Pl. 208 (1753). **Lectotype:** *C. manghas* L. (*vide* Pichon, Notul. Syst. (Paris) 13: 221 (1948)).

Seem., Fl. Vit. 157 (1866); Pichon, Notul. Syst. (Paris) 13: 221 (1948); Markgraf, Fl. Madagasc. fam. 169: 156 (1976); Lippold, Feddes Repert. 91: 51 (1980); Boit., Fl. Nouv.-Caléd. et Dépend. 10: 212 (1981); A.C. Smith, Fl. Vit. Nov. 4: 89 (1988).

Perennial shrubs or trees, latex white; foliage glabrous, drying black. Leaves spirally arranged on stems, clustered at stem apices, petiolate; lamina coriaceous, entire or sinuate, secondary lateral nerves spaced, connected by a marginal nerve; lacking colleters at lamina base. Inflorescences terminal, pedunculate, laxly cymose, glabrous, bracteate. Flowers pedicellate. Calyx deeply divided, lobes \pm free, caducous, lacking colleters. Corolla hypocrateriform; tube glabrous externally, internally with or without simple indumentum, swollen about stamens, somewhat constricted above stamens; lobes ovate, obovate, obtuse or emarginate, sinistrorse in bud. Stamens inserted in upper part of tube; filaments short (1–2 mm long), slender, glabrous; anthers obliquely ascending, lanceolate, contiguous to style-head with filiform apical appendages; disk lacking. Ovary bicarpellate, each carpel usually with 4 biseriate ovules; style-head composed of 2 annular swellings surmounted by 2 apical, conical, obtuse, thick, appressed stigmatic appendages. Fruits apocarpous; mericarps drupaceous; exocarp fleshy; mesocarp reticulate-spongy with numerous fibers independent of the endocarp; endocarp lignified, smooth or rugose-striate externally, with an apical wing; seeds 1 per locule, compressed, ellipsoid or obloid, not or narrowly winged, hilum large, lacking a coma.

Seven species distributed in Madagascar, Indian Ocean islands, Asia, Malesia, Melanesia and Australia. Four species in Papuaia and Australia.

Key to species of *Cerbera* in Australia and Papuaia

1. Leaf lamina with tertiary venation obscure below; flowers numerous in cyme, generally more than 50 2
 Leaf lamina with tertiary venation reticulate and prominent below; flowers few in cyme, generally less than 30 3
2. Leaf lamina with 13–20 secondary veins below; corolla tube 8–12 mm long 1. *C. floribunda*
 Leaf lamina with 33–37 secondary veins below; corolla 15–18 mm long 2. *C. inflata*
3. Leaf lamina with 25–32 secondary veins below; corolla with red centre, tube 25–35 mm long 3. *C. manghas*
 Leaf lamina with 14–18 secondary veins below; corolla lacking red centre, tube 10–11 mm long 4. *C. dumicola*

1. ***Cerbera floribunda*** Schumann in Schumann & Hollrung, Fl. Kais. Wilh. Land 111 (1899). **Type:** Papua New Guinea. WEST SEPIK PROVINCE: Augusta fluss, *M. Hollrung* 849 (lecto (here designated): K (photo! BRI); isolecto: BO!, L (photo! BRI); Papua New Guinea. 1887, *M. Hollrung* 717 (lectopara: BO!, K (photo! BRI).

[*Cerbera odollam* auct. non Gaertner: S. Moore, J. Bot. 61, suppl. 32 (1923)].

Schumann, Notizbl. Bot. Gart. Berlin-Dahlem 2: 139 (1898); Boerl., Handl. Fl. Ned. Ind. 2(2): 394 (1899); Schumann & Lauterb., Fl. Schutzgeb. Sudsee 505

(1901); Markgraf, Nova Guinea 14: 284 (1926); Bot. Jahrb. Syst. 61: 198 (1927); C.T. White, Contr. Arnold Abor. 4: 92 (1933); van Royen *et al.*, Manual Forest Trees Papua & New Guinea, Part 9. Apocynaceae 22–23 (1964); D. Foreman, Checkl. Vasc. Pl. Bougainville. Bot. Bull. No: 5: 102–103 (1971).

Illustrations: van Royen *et al.*, Manual Forest Trees Papua & New Guinea, Part 9. Apocynaceae 23 (1964); Foreman, Checkl. Vasc. Pl. Bougainville. Bot. Bull. No. 5: 103 (1971).

Tree to 30 m high, latex white; foliage and inflorescence glabrous. Bark brown to black grey; sap wood white, heart wood white. Leaf lamina lanceolate-elliptic, 9–24 cm long, 2–5 cm wide, discolorous, margins entire and not sinuate; upper surface dark glossy green, venation obscure; lower surface pale green, secondary veins 13–20 per side of midrib, tertiary venation obscure; tip acute to short acuminate; base cuneate; petiole 30–40 mm long, 1.8–2.0 mm wide. Inflorescence a much branched cyme up to 17 cm long; peduncle 4–6 cm long; flowers numerous with generally over 50 present. Flowers 18–20 mm long, c. 5 mm diameter, sweetly scented; pedicels 2–3 cm long. Sepals lanceolate-ovate, 5.0–6.4 mm long, 3–5 mm wide. Corolla primarily white, but sometimes pinkish-white internally towards tips of lobes and yellowish at bottom of lobes; tube 8–12 mm long, 2.7–3.0 mm diameter, white, constricted above anthers, glabrous internally; lobes lanceolate, 7–10 mm long, 1.8–2.0 mm wide, light green, glabrous. Stamens inserted in upper 3 mm of tube; anthers 1.2–1.3 mm long, c. 0.7 mm wide. Fruit obloid-globose, 9–11 cm long, 5.0–5.5 cm wide, 4.5–4.8 cm thick, pointed at end away from pedicel, blue when ripe. **Fig. 1D.**

Selected specimens: Irian Jaya. Sidei, c. 50 km W of Manokwari, *Iwanggin* BW5753 (CANB ex L); Japen Island, Soemberbaba, Jul 1961, *Koster* BW11159 (BO, BRI ex L); Bernhard Camp, Idenburg River, May 1939, *Brass* 14109 (BO, BRI ex A). Papua New Guinea. MANUS PROVINCE: Rambutoy Island, Peninsula Admin. Centre, 2°18'S, 147°47'E, Mar 1981, *Kerenga & Croft* LAE77382 (BRI). EAST SEPIK PROVINCE: Kankanaman, 4°05'S, 144°05'E, May 1969, *Millar* NGF37518 (BRI). NEW BRITAIN PROVINCE: Piriloma Village, 6°06'S, 150°45'E, Mar 1965, *Sayers* NGF29192 (BRI). NEW IRELAND PROVINCE: Inland from Lavongai, c. 26 miles [43.3 km] from Kavieng, 2°46'S, 151°02'E, Jan 1967, *Coope et al.* NGF29603 (BO, BRI). WESTERN HIGHLANDS PROVINCE: 6 miles [10 km] from Lake Kopiago on Paga Hill road, 5°22'S, 142°33'E, Nov 1968, *Galore & Vandenburg* NGF41029 (CANB). EASTERN HIGHLANDS PROVINCE: Okasa, 10 miles [16 km] SW of Okapa, May 1967, *Womersley* NGF24924 (BRI). MOROBE PROVINCE: Wagau, 6°50'S, 146°50'E, Jan 1965, *Sayers* NGF21566 (BRI, CANB). MADANG PROVINCE: Near Usino Village, Ramu Valley, Jul 1955, *Hoogland* 5016 (BRI, CANB). WESTERN PROVINCE: Dagwa, Oriomo River, Feb–Mar 1934, *Brass* 5991 (BO, BRI ex A). CENTRAL PROVINCE: Kagi Gap area, Kokoda trail, 9°09'S, 147°43'E, Sep 1973, *Croft & Lelean* NGF34727 (BRI). GULF PROVINCE: West bank, junction of Vailala & Lohiki Rivers, Jan 1966, *Schodde* 4311 & *Craven* (BRI, CANB). NORTHERN PROVINCE: Lower W slopes of Topographers, Aug 1954, *Saunders* 44 (BRI, CANB). MILNE BAY PROVINCE: Normanby Island, near Miadeba airstrip, 9°50'S, 150°55'E, Nov 1976, *Croft et al.* LAE68858 (BRI). Solomon Islands. Santa Ysabel, Bogotu Peninsula, near Koloajoa Village, Mar 1964, *Whimmore* BSIP4110 (BSIP). Australia. Queensland. COOK DISTRICT: Daintree, Jul 1943, *Blake* 14992 (BRI, CANB); V.C.L. Noah, Oliver Creek, 16°10'S, 145°25'E, Nov 1978, *Gray* 1095 (QRS); Porn. 62, Alexandra, 16°10'S, 145°25'E, Dec 1972, *Hyland* 6606 (QRS).

Distribution and habitat: Widespread in New Guinea and Solomon Islands, but in Australia it is restricted to a small area near Cairns (**Map 1**). Plants grow along creeks or in marshy areas and are always found near permanent water.

Notes: *C. floribunda* is a distinctive species and the large blue fruits are often a feature of the forest floor where this species may be locally common. In Australia it is only likely to be confused with *C. inflata*, which is restricted to higher altitudes on the Atherton Tableland region. I have selected *Hollrung* 849 as lectotype from the two syntypes, as it is more widely represented in herbaria and has a more precise collection locality than *Hollrung* 717.

Local names and ethnobotanical use: A listing of local names with dialects and region of origin is given in **Table 1**. The wood is used for mouldings and interior finishings in Bougainville (Foreman 1971) and other parts of Papua New Guinea, but is susceptible to blue stain fungal attack (van Royen *et al.* 1964). In Solomon Islands the wood is used for carving and medicine (*Henderson & Santalau* 491 (BSIP)). Medicinal application is for aches and sores with the leaves heated in a fire, after which they are rubbed on the sore area or the person lies down on the warm leaf.

Conservation status: Not rare or endangered. Conserved in Cape Tribulation National Park north of the Daintree River in north Queensland.

Table 1. Local names for *Cerbera floribunda*.

Name	Dialect & Region	Voucher
Agar	Onijob	Hoogland 4603 (CANB)
Aimalua	Kwara'ae; S.I.	Gafui <i>et al.</i> BSIP16430 (BSIP)
Aitongatonga	Kwara'ae; S.I.	Whitmore BSIP921 (BSIP)
Babai	Biak; Irian Jaya	Koster BW11159 (BRI)
Beembin	Wagau*; Morobe	Sayers NGF21566 (CANB)
Biegbau	Haltam; Irian Jaya	Moll BW15725 (BO)
Brebong	Kemtoek; Irian Jaya	Iwanggin BW9121 (BO)
Djokanabaiu	Minufia; Northern	Saunders 44 (BRI)
Ekwa	Onjob; Northern	Saunders 44 (BRI)
Grey Milkwood	Australian; Cook	Cause <i>et al.</i> (1989)
Iona	Akuna; Madang	Smith NGF1088 (BRI)
Kiriwi	Pom; Irian Jaya	Schram BW15046 (BO)
Milky Pine	Atherton*; Cook	personal obs.
Nibwafrim	Amberbaken; Irian Jaya	Koster BW6743 (BO)
Oero-Oego	Kapaukoe; Irian Jaya	Vink & Schram BW8713 (BO)
Patega	Usino; Madang	Hoogland 5016 (BRI)
Pea,paa	Maiama*; Morobe	Ridsdale NGF31684 (BRI)
Rubbtree	Australian; Cook	Cause <i>et al.</i> (1989)
Sebokko	Manikiang; Irian Jaya	Iwanggin BW5753 (CANB)
Sowoek	Mooi; Irian Jaya	Moll BW11727 (BO)
Sungwiau	Waskuk; Sepik	Hoogland 10064 & Craven (BRI)
Supuk	Bembi; Madang	Hoogland 5016 (BRI)
Tarau	Subdidi*; New Britain	Frodin NGF26589 (BRI)
Tero	Rawa; Madang	Hoogland 5016 (BRI)
Totongwala	Kwara'ae; S.I.	Whitmore BSIP4110 (BSIP)
Towl	Jal; Madang	Hoogland 5016 (BRI)
Vao	Marovo; S.I.	Chapman BSIP428 (BSIP)

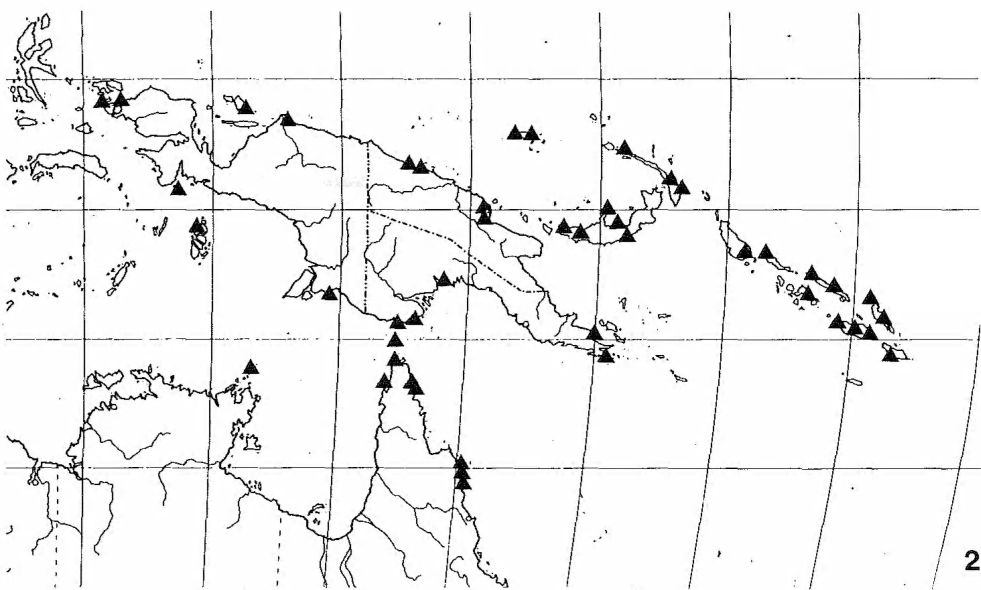
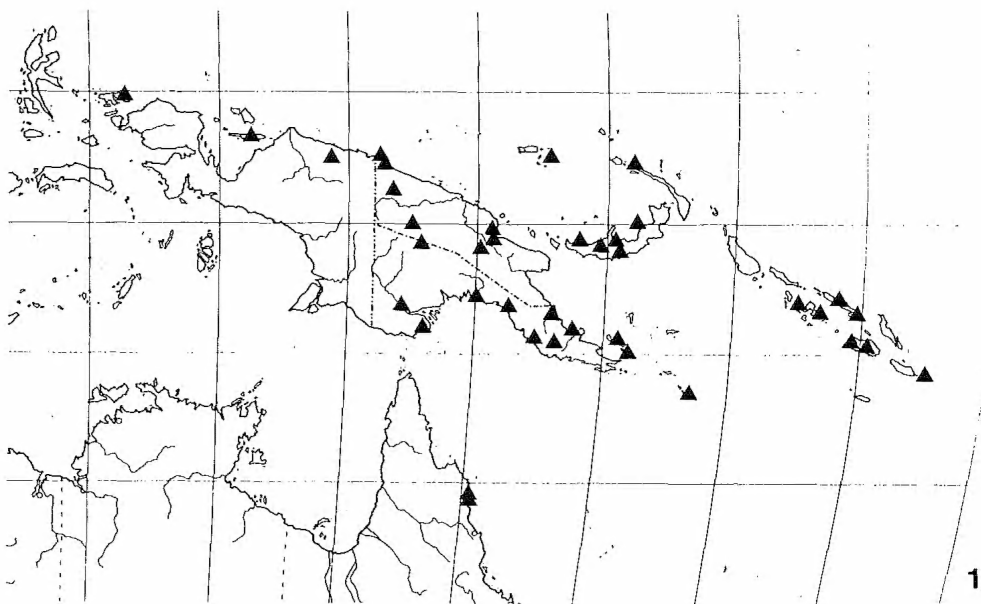
* indicates locality name only, dialect not indicated. Abbreviation: S.I. = Solomon Islands.

2. *Cerbera inflata* S.T. Blake, Proc. Roy. Soc. Queensland 70: 33 (1959). *Cerbera dilatata* S.T. Blake, Proc. Roy. Soc. Queensland 59: 161 (1948), nom. illeg.; non Markgraf (1927). **Type:** Australia, Queensland. COOK DISTRICT: Near Goldsborough, Upper Mulgrave River, 28 July 1943, *S.T. Blake* 15033 (holo: BRI!; iso: CANB!).

[*Cerbera manghas* auct. non L.: C.T. White, Contr. Arnold Arbor. 4: 92 (1933)].

Tree to 30 m high, latex white; foliage and inflorescence glabrous. Bark grey, pustular with long fissures; sap wood white, heart wood white. Leaf lamina lanceolate-elliptic, discolorous, margins entire and not sinuate; upper surface dull green, venation obscure; lower surface pale green, secondary veins 33–37 per side of midrib, tertiary venation obscure; tip short acuminate; base cuneate; petiole 20–37 mm long, c. 2 mm diameter. Inflorescence a much branched cyme, up to 15 cm long; peduncles up to 5 cm long; flowers numerous, with generally more than 50 present. Flowers 18–27 mm long, 10–13 mm diameter, sweetly scented; pedicels 11–15 mm long. Sepals lanceolate, 4–8 mm long, 1.5–3.0 mm wide. Corolla white to cream-pink; tube 15–18 mm long, 1–2 mm diameter, slightly constricted above anthers, glabrous internally; lobes obovate, c. 6 mm long, 3–4 mm wide, glabrous. Stamens inserted 2.2–2.5 mm from top of tube; anthers 2.5–2.8 mm long, 1.7–1.8 mm wide. Fruit ellipsoid, somewhat pointed at end away from pedicel, 6–7 cm long, 3.0–3.2 cm wide, 2.0–2.5 cm thick, purple when ripe. **Fig. 1A.**

Selected specimens. Australia, Queensland. COOK DISTRICT: Kulara, 15 miles [25 km] WNW of Atherton, May 1921, *Hamilton* [AQ212353] (BRI); Atherton, Jan 1950, *Webb* 5118 (CANB); Lake Eacham, 17°17'S, 145°37'E,



Maps 1-2. Distribution in Australia and Papuaia of *Cerbera* spp.: 1. *C. floribunda*. 2. *C. manghas*.

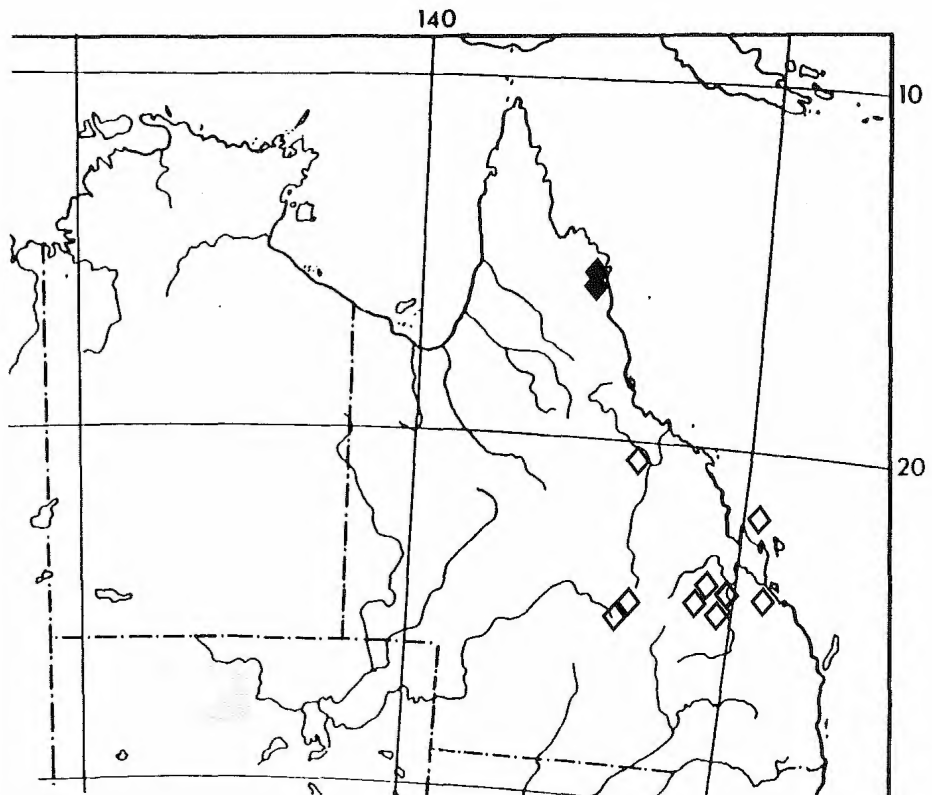
Feb 1956, *Dansie* C36 (CANB); Juara Creek area, Danbulla, Aug 1948, *Smith* 3734 (BRI); Danbulla, near Atherton, Nov 1942, *Blake* 14749 (BRI,DNA); S.F.R. 185, Downfall L.A., 17°10'S, 145°35'E, Jul 1971, *Sanderson* 28 (QRS); S.F.R. 185, Danbulla, 17°10'S, 145°37'E, Apr 1971, *Stocker* 673 (BRI,CANB,QRS); Gadgarra Reserve, Atherton, Jul 1929, *Kajewski* 1141 (BRI); S.F.R. 700, Gadgarra, Gillies L.A., 17°13'S, 145°42'E, Dec 1988, *Hyland* 13786 (QRS); S.F.R. 310, Caribou L.A., Dec 1981, *Hyland* 11414 (QRS); Yungaburra, Jan 1918, *White* [AQ212359] (BRI); near Malanda, Sep 1943, *Blake* 15249 (BRI,CANB); Mt Bartle Frere, north peak, Aug 1943, *Blake* 15244 (BRI); Mt Toressa, 1904, *Bailey* [AQ212354] (BRI); S.F.R. 310, Windin L.A., 17°21'S, 145°45'E, Aug 1979, *Moriarty* 2653 (QRS); S.F.R. 310, Bora L.A., 17°21'S, 145°46'E, Nov 1981, *Gray* 2267 (QRS); S.F.R. 755, Barong L.A., 17°32'S, 145°52'E, 1980, *Gray* 1727 (QRS); Jago, near Innisfail, Sep 1943, *Blake* 15270 (BRI); Babinda, Jul 1943, *Blake* 15024 (BRI,CANB); Deeral, near Babinda, Jul 1943, *Blake* 14970 (BRI).

Distribution and habitat: Restricted to north-east Queensland (Map 3). Plants grow in rainforest, generally away from permanent water.

Notes: As noted by Blake (1948), *C. inflata* is allied to *C. floribunda* but differs in the somewhat narrower leaves with more lateral nerves, the smaller flowers and the smaller ellipsoid fruit.

Local names: "Milky Pine" – *Blake* 14749 (BRI); "Joojooga" – *Bailey* [AQ212354] (BRI); "Grey Milkwood" or "Rubbertree" – *Cause et al.* (1989).

Conservation status: Widespread in north-east Queensland and not considered rare or endangered by the current author, despite the listing in Thomas and McDonald (1989).



Map 3. Distribution of *Cerbera inflata* ◆ and *C. dumicola* ◇.

3. *Cerbera manghas* L., Sp. Pl. 208 (1753); *Tanghinia manghas* (L.) G. Don, Gen. hist. 4: 98 (1838). **Type:** description of Osbeck (Dagbok öfwer en Ostindisk Res., Stockholm 91 (1757)), cited in L., Sp. Pl. 208 (1753); *vide* Fosberg in Boiteau (1981).

J. Forster, Fl. Ins. Austr. Prodr. 19 (1786); Schumann, Notizbl. Bot. Gart. Berlin-Dahlem 1: 55 (1895); Merr. Interpret. Rumph. Herb. Amb. 432 (1917); Markgraf, Nova Guinea 14: 284 (1926); Domin, Biblioth. Bot. 89: 522 (1928); Markgraf, Bot. Jahrb. Syst. 61: 197 (1927); Guillaumin, J. Arnold Arb. 13: 18 (1932); Boit., Fl. Nouv.-Caléd. et Dépend. 10: 214 (1981); Fosb. & Sach. in D.J. Carr, Sydney Parkinson 186 (1983); A.C. Smith, Fl. Vit. Nov. 4: 89 (1988).

Cerbera odollam var. *mugfordii* Bailey, Queensland Agric. J. 3: 282 (1898) (as '*mugfordii*'); *C. manghas* var. *mugfordii* (Bailey) Domin, Biblioth. Bot. 89: 522 (1928). **Type:** [Mourilyan Harbour, *W. Mugford*] [QAQ332823] (holo: BRI!).

[*Cerbera odollam* auct. non Gaertner: Benth., Fl. Austral. 4: 306 (1869); Bailey, Queensland fl. 3: 981 (1900)].

Illustrations: Sims, Bot. Mag. 43: t. 1845 (1816); K.A.W. Williams, Native Pl. Queensland 1: 67 (1979), 3: 63 (1987); Fosb. & Sach. in D.J. Carr, Sydney Parkinson pl. 177 (1983); A.C. Smith, Fl. Vit. Nov. 4: 90, fig. 38 (1988).

Small tree to 12 m high; latex white; foliage and inflorescence glabrous. Bark light grey, scaly; sap wood white, heart wood white. Leaf lamina elliptic-obovate, 15–25 cm long, 4–7 cm wide, discolorous, margins entire and not sinuate; upper surface dark glossy green, venation ± obscure; below pale green, secondary veins 25–32 per side of midrib, tertiary venation reticulate and prominent; tip acute, short acuminate or long acuminate; base cuneate; petiole 15–62 mm long, c. 1 mm wide. Inflorescence a little-branched cyme to 20 cm long; peduncles up to 8 cm long; flowers few, with generally less than 30 present. Flowers 30–40 mm long, 20–35 mm diameter, sweetly scented; pedicels 10–20 mm long. Sepals lanceolate to lanceolate-ovate, 12–25 mm long, 4–9 mm wide. Corolla white with red 'eye' at top of tube; tube 22–35 mm long, 2.0–2.5 mm diameter, constricted above anthers near top, with sparse to dense indumentum internally; lobes ovate to obovate, 18–26 mm long, 6–10 mm wide. Stamens inserted c. 2 mm below top of tube; anthers 1.8–2.0 mm long, 1.0–1.2 mm wide. Fruit ovoid-globose, 6–7 cm long, 3.5–4.0 cm wide; 3.5–4.0 cm thick, red when ripe. **Fig. 1B, E–G, J–L.**

Selected specimens. Irian Jaya. Batanta Island, W of Sorong, Marchesa Bay, Amdoei Village, Apr 1954, *van Royen* 3545 (BO,BRI ex L); Adi Island, Feb 1961, *Moll* BW9827 (BRI, CANB). Papua New Guinea. MANUS PROVINCE: Pelikawa, 2°07'S, 146°44'E, Jun 1971, *Stone & Streimann* LAE53788 (BRI). NEW BRITAIN PROVINCE: Torlu River, 6°00'S, 151°02'E, Mar 1965, *Sayers* NGF24208 (BRI). NEW IRELAND PROVINCE: Kavieng, Oct 1964, *Millar* NGF23816 (BRI). BOUGAINVILLE PROVINCE: Karngu, Buin, Oct 1930, *Kajewski* 2239 (BRI ex A). EAST SEPIK PROVINCE: Cape Wom International Park, c. 8 km NW of Wewak town, 3°35'S, 143°35'E, Nov 1976, *Wiakabu & Yefle* LAE70329 (BRI). MOROBE PROVINCE: Markham River mouth, W of Lae, 6°45'S, 147°00'E, Aug 1964, *van Royen* NGF20068 (BRI). MADANG PROVINCE: Tukai, 50 miles [83.3 km] N of Madang, Mar 1968, *Cooe & Katik* NGF32749 (BRI). WESTERN PROVINCE: Daru Island, Mar 1936, *Brass* 6272 (BO,BRI ex A). GULF PROVINCE: Keuru, Mar 1926, *Brass* 1191 (BRI). MILNE BAY PROVINCE: Near Tapio Village, Cape Vogel Peninsula, Jul 1954, *Hoogland* 4332 (BRI,CANB). Solomon Islands. Guadalcanal. Mbokokimbo River, logging road, c. 2 km SE of main road, 9°28'S, 160°22'E, Jun 1991, *Forster* 8652 & *Liddle* (BISH,BRI,K,L,MEL); Santa Cruz Islands, Tomotu Noi Island, 10°47'S, 166°04'E, Apr 1972, *Powell et al.* BSIP19891 (BSIP,CANB). Australia. Northern Territory. Wessel Islands, 11°19'S, 136°36'E, Oct 1972, *Latz* 3500 (BRI,DNA). Queensland. COOK DISTRICT: Mutee Head, Cape York, 10°55'S, 142°15'E, Mar 1990, *Forster* 6430 (BRI,CANB,DNA,K,L,MEL,PERTH,QRS); Kennedy Hill Gorge, 12°28'S, 143°16'E, Jun 1989, *Forster* 5404 & *Kenning* (BRI,L,MEL,QRS); Claudie River (tidal reaches), 12°50'S, 143°20'E, Jul 1972, *Hyland* 6207 (BRI,QRS); Ella Bay, near Innisfail, Jul 1943, *Blake* 15256 (BRI,CANB). WIDE BAY DISTRICT: Freshwater Creek, S of Double Island Point, Aug 1964, *Everist* 7639 (BRI).

Distribution and habitat: Widespread in Malesia and Melanesia. Common in New Guinea and Solomon Islands; in Australia relatively common in north Queensland with one locality in Northern Territory (**Map 2**). Plants at the Freshwater Creek locality in south-east Queensland have been collected numerous times since the 1920s and comprise 2 or 3 trees which must have resulted from a chance establishment long ago. This colony does not seem to have expanded over a period of 70 years and is not considered native to south-east Queensland.

Plants are generally found in the littoral zone behind the mangroves, often in monsoon vine-thicket along the shore or may extend inland in lowland rainforest communities.

Notes: Smith (1988) discussed the typification of this species' name and supported Fosberg's (in Boiteau 1981) lectotypification directly from the Osbeck description based on a Javan specimen, that was cited by Linnaeus.

Boiteau (1981) recognised several varieties and forms under *C. manghas*; however, apart from *C. manghas* f. *manghas*, most of these are probably referable to *C. odollam* Gaertner (Smith 1988).

In a red type folder at BRI is a specimen dating from Bailey's time that is probably the type of *C. odollam* var. *mugfordii*. Despite the lack of label data that agrees with the protologue, there are no other specimens at BRI that could be the Mugford collection and it seems reasonable to assume that this is the type.

Local names and ethnobotanical use: A listing of local names, the dialects of origin, and the relevant vouchers are given in Table 2. In Solomon Islands, the crushed leaves are used on boils or polio with accompanying prayers, and the wood for carving paddles and bowls (Powell BSIP19891 (BSIP), Henderson & Oimae 175 (BSIP)). In Torres Strait, the fruit is used by children as a ball (Lawrie [AQ004029] (BRI)).

Conservation status: Not rare or endangered. Conserved in Cape Wom International Park, East Sepik in Papua New Guinea, but not known with certainty to occur in any Conservation Reserves in Australia.

Table 2. Local names for *Cerbera manghas*.

Name	Dialect & Region	Voucher
Aikikira	Kwara'ae; S.I.	Kere BSIP5094 (BSIP)
Aimalua	Kwara'ae; S.I.	Boraule <i>et al.</i> BSIP9318 (BSIP)
Aitu	Laukana; Morobe	White NGF11155 (BRI)
Babai	Biak; Irian Jaya	Moll BW9827 (CANB)
Bulo	Tasia*; S.I.	Brass 3284 (BRI)
Dalovi	Manukiki; S.I.	Griffith 4/24 (BRI)
Gingum	Oomsis*; Morobe	White NGF11170 (BRI)
Grey Milkwood	Australian; Cook	Cause <i>et al.</i> (1989)
Kaihto	Gabobora; Milne Bay	Hoogland 4332 (BRI)
La Toto	Rapuri; New Britain	Floyd NGF6451 (BRI)
Ngambako	Nangu; S.I.	Powell <i>et al.</i> BSIP19891 (BSIP)
Papoca	Aniaeri; Irian Jaya	Aet & Idjan 614 (BO)
Rubbertree.	Australian; Cook	Cause <i>et al.</i> (1989)
Sas	Biak; Irian Jaya	van Royen 3545(BRI)
Soto	Manukiki; S.I.	Griffith 4/24 (BRI)
To	Santa Ana*; S.I.	Yen BSIP18113 (BSIP)
To'o	Are'are; S.I.	de Coppet 146 (BSIP)
Toto	Kulumo; New Britain	Barker & Vinas LAE66541 (BRI)
Totongwala	Kwara'ae; S.I.	Gafui <i>et al.</i> BSIP17448 (BSIP)
Totora	Karngu*; Bougainville	Kajewski 2239 (BRI)
Vao	New Georgia; S.I.	Waterhouse 303 (BRI)
Wai	Dauan Is; Cook	Lawrie [AQ004029] (BRI)

* indicates locality name only, dialect not indicated. Abbreviations: S.I. = Solomon Islands.

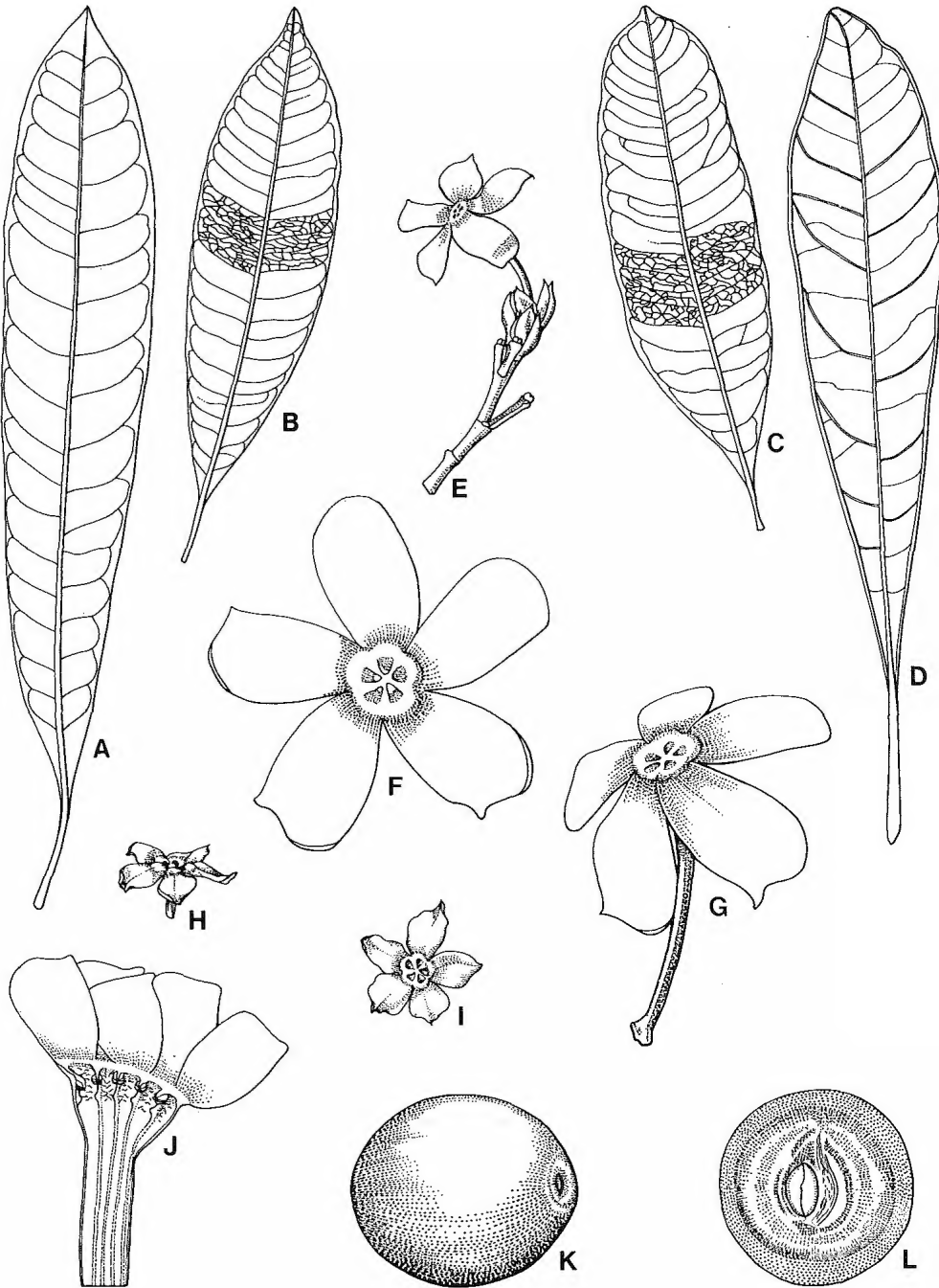


Fig. 1. A-D. lower leaf surfaces showing venation, $\times 5$. A. *Cerbera inflata*. B. *C. manghas*. C. *C. dunicola*. D. *C. floribunda*. E-G. *C. manghas*: E. inflorescence $\times 0.5$. F. face view of flower $\times 1$. G. side view of flower $\times 1$. H-I. *C. dunicola*: H. side view of flower $\times 1$. I. face view of flower $\times 1$. J-L. *C. manghas*: J. longitudinal section of flower showing disposition of anthers in tube $\times 1$. K. intact fruit $\times 0.5$. L. half fruit showing interior $\times 0.5$. A, Smith 3734; B,E-G,J-L, Forster 6430; C,H-I, Batianoff 11705b, D, Blake 14992. Del. W. Smith.

4. *Cerbera dumicola* P. Forster sp. nov. ad *Cerbera manghas* L. affinis, a qua habitu fruticoso, venis lateralibus laminae folii paucioribus (14–18), tubo corollae 10–11 mm longo, et lobis corollae 8–9 mm longis, differt. **Typus:** Queensland. PORT CURTIS DISTRICT: Howard Point, Middle Percy Island, 55 km NE of Arthur Point, Shoalwater Bay, 21°40'S, 150°16'E, 31 October 1989, G.N. Batianoff 11705B, I. Champion, P. Thompson & H.A. Dillewaard (holo: BRI!; iso: MEL!, QRS!).

Shrub or small tree to 4 m high, latex white; foliage and inflorescence glabrous. Bark light grey, fissured longitudinally, somewhat scaly on taller plants; sap wood white, heart wood white. Leaf lamina elliptic-lanceolate to elliptic-oblong, 5–17 cm long, 1.5–6.0 cm wide, discoloured, margins often variously lobed and sinuate; upper surface glossy light green, venation obscure; lower surface pale green, secondary veins 14–18 per side of midrib, tertiary reticulate venation prominent; tip obtuse, acute or short acuminate; base cuneate; petiole 5–12 mm long, 0.7–0.8 mm wide. Inflorescence a little branched cyme up to 8 cm long; peduncle up to 5 cm long; flowers few, with generally less than 30. Flowers 15–18 mm long, 14–20 mm diameter, sweetly scented; pedicels 31–45 mm long. Sepals lanceolate-ovate, 8–9 mm long, 3.5–5.0 mm wide. Corolla white; tube 10–11 mm long, 1.8–2.2 mm diameter, slightly constricted above anthers, with dense indumentum internally; lobes ovate to obovate, 8–9 mm long, 4.5–5.0 mm wide. Stamens inserted c. 2 mm from top of tube; anthers 1.0–1.2 mm long, 0.6–0.7 mm wide. Fruit globose-ovoid, c. 5.5 cm long, 4 cm wide, 4 cm thick, colour unknown. **Fig. 1C, H, I.**

Specimens examined. Australia. Queensland. NORTH KENNEDY DISTRICT: Barrabas Scrub, 20°10'S, 146°45'E, May 1972, Hyland 6097 (QRS). PORT CURTIS DISTRICT: West Bay, Middle Percy Island, 55 km NE of Arthur Point, Shoalwater Bay, 21°40'S, 150°16'E, Nov 1989, Batianoff 11627 *et al.* (BRI). LEICHHARDT DISTRICT: (400–500 miles inland from Rockhampton), 1886, Govt. Surveyor [MEL 1515485] (MEL); range between the Dawson & Mackenzie, [MEL 1515808] (MEL); c. 80 km NE of Emerald, 10 km SSE of "Booroondara", 22°54'S, 148°31'E, Oct 1978, Jones 6 (CBG); Blackwater, Jun 1942, Flowers [AQ212427] (BRI); 5 km NW of Wowan, Banana Shire, 23°50'S, 150°10'E, Feb 1990, Gillespie 4837 (BRI); 23°55'S, 148°48'E, Dec 1985, Thompson [AQ399095] (BRI); Portion 130, Gogango Shire, Parish of Fleetwood, Dec 1983, Heppell [AQ398635] (BRI); Below Blackdown Tableland, Nov 1975, Williams [AQ113486] (BRI); Duaringa, Oct 1943, Blake 15360 (BRI); ditto, Oct 1943, Murray [AQ212426] (BRI); ditto, Nov 1943, White 12460 (BRI); Baralaba, Feb 1943, Maclean [AQ212430] (BRI); 'Coolum', Baralaba on eastern slope of Dawson Range, Nov 1943, Maclean [AQ212429] (BRI); near Stanwell, Apr 1876, O'Shanesy 1829 (MEL). MITCHELL DISTRICT: Romulus Tableland, 57 km SE of Blackall on the top of Enniskillen Range, 24°44'S, 145°52'E, Jul 1975, Beeston 1430c (BRI); Ravensbourne-Mount Edinburgh area, Blackall/Tambo Shire, Jul 1990, Roche [AQ472683] (BRI).

Distribution and habitat: Central coastal and subcoastal Queensland (**Map 3**). Plants occur primarily in lancewood (*Acacia shirleyi* Maiden) thickets away from the coast but may also be found in semi-evergreen vine thickets near the coast.

Notes: *C. dumicola* was discovered in 1876 by R. O'Shanesy who sent material (a sterile leafy stem) to von Mueller in MEL. Although collected sporadically since (collections in MEL), its distinctiveness was only recognised by the late S.T. Blake who made or organised a number of collections of the plant in the 1940s. Despite having fertile material (scrappy flowers only), Blake did not describe the plant and sporadic and nearly always sterile collections were made up until 1990, when good flowering material procured by G. Batianoff and associates allowed for its description. The fruit description is based on a single old sectioned fruit [MEL 1515485] (MEL) and further collections are still required for assessment of variation in the taxon.

C. dumicola is a distinctive species by virtue of the shrubby to small tree habit and the foliage often having sinuate margins. It is most closely allied to *C. manghas* but differs from that species in the shrubby habit, fewer lateral veins in the leaf lamina (14–18 per side of midrib); corolla lacking a red centre, the corolla tube 10–11 mm long and the corolla lobes 8–9 mm long.

Etymology: The specific epithet alludes to the common occurrence of this species in thickets.

Conservation status: Not known to occur in any conservation reserves. The various populations in central Queensland must be considered under threat from agriculture and mining activities. Urgent survey work is required to determine the status of this taxon. A relevant conservation coding is 3RC (cf. Briggs & Leigh 1988).

Acknowledgements

Assistance with field work in north Queensland and Solomon Islands was given by G. Kenning, D. Liddle and M.C. Tucker. G. Batianoff (BRI) collected fertile material of *C. dumicola*. The illustrations were prepared by W. Smith (BRI) with funding from the Australian Biological Resources Study (ABRS). P.R. Sharpe translated various German texts. A.S. George (ABRS) translated the diagnosis into latin. The herbaria AD, BO, BRI, BSIP, CANB, CBG, DNA, K, L, MEL and QRS allowed access to collections either at their institutions or on loan. Loans staff at these institutions and BRI expedited rapid processing. G. Leach (DNA) while Australian Botanical Liaison Officer at Kew, U.K., located and photographed type material. The author was funded for this project by ABRS during 1991–92. This assistance is gratefully acknowledged.

References

- BAILEY, F.M. (1900). Apocynaceae. Queensland Flora 3: 974–995. Brisbane: Government Printer.
- BENTHAM, G. (1869). Apocynaceae. Flora Australiensis 4: 301–324. London: L. Reeve.
- BLAKE, S.T. (1948). Studies in Australian Apocynaceae and Asclepiadaceae, 1. *Proceedings of the Royal Society of Queensland* 59: 161–168.
- BLAKE, S.T. (1959). New or noteworthy plants, chiefly from Queensland, 1. *Proceedings of the Royal Society of Queensland* 70: 33–46.
- BOITEAU, P. (1981). Flore de la Nouvelle-Calédonie et Dependances. 10. Apocynacées. Paris: Muséum National d'Histoire Naturelle.
- BRIGGS, J.D. & LEIGH, J.H. (1988). Rare or Threatened Australian Plants. 1988 Revised Edition. Australian National Parks and Wildlife Service Special Publication No. 14. Canberra: Australian National Parks and Wildlife Service.
- CAUSE, M.L., RUDDER, E.J. & KYNASTON, W.T. (1989). Queensland Timbers, their nomenclature, density and lycitid susceptibility. Technical Pamphlet No. 2. Brisbane: Queensland Department of Forestry.
- FOREMAN, D.B. (1971). A Check List of the Vascular Plants of Bougainville, with descriptions of some common forest trees. Botany Bulletin No. 5. Lae: Department of Forests, Division of Botany.
- FOSBERG, F.R., BOITEAU, P. & SACHET, M.-H. (1977). Nomenclature of the Ochrosiinae (Apocynaceae): 2. Synonymy of *Ochrosia* Juss. and *Neisosperma* Raf. *Adansonia*, ser. 2, 17: 23–33.
- HOLMGREN, P.K., HOLMGREN, N.H. & BARNETT, L.C. (eds) (1990). Index Herbariorum. Part I: The Herbaria of the World. New York: New York Botanical Garden.
- LINNAEUS, C. (1753). Species Plantarum. Stockholm: Laurenti, Salvii.
- LIPPOLD, H. (1980). Die gattungen *Thevetia* L., *Cerbera* L. und *Cascabela* Rafin. (Apocynaceae). *Feddes Repertorium* 91: 45–55.
- MARKGRAF, F. (1926). Apocynaceae. *Nova Guinea* 14(2): 278–291.
- MARKGRAF, F. (1927). Die Apocynaceen von Neu-Guinea. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 61: 164–222.
- MARKGRAF, F. (1972). Florae Malesianae Praecursores LIII. Apocynaceae II. 6. *Urularia*, 7. *Willughbeia*, 8. *Kopsia*. *Blumea* 20: 407–425.
- SMITH, A.C. (1988). Flora Vitiensis Nova. Vol. 4. Lawai: Pacific Tropical Botanical Garden.
- THOMAS, M.B. & MCDONALD, W.J.F. (1989). Rare and Threatened Plants of Queensland. 2nd Edition. Brisbane: Queensland Government.
- VAN ROYEN, P., WOMERSLEY, J.S., WHITE, K.J., COLWELL, S.J. & PEARCE, D. (1964). Manual of the Forest Trees of Papua and New Guinea. Part 9. Apocynaceae. Port Moresby: Department of Forests.
- WHITE, C.T. (1933). Ligneous plants collected for the Arnold Arboretum in north Queensland by S.F. Kajewski in 1929. *Contributions from the Arnold Arboretum of Harvard University* 4: 1–113.

Accepted for publication 7 February 1992